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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,717	10/19/2001	Kireeti Kompella	1014-013US01	9695

28863 7590 01/12/2007  
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EXAMINER
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SHAW, PELING ANDY

ART UNIT	PAPER NUMBER
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2144

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/045,717

Applicant(s)

KOMPELLA, KIREETI

Examiner

Peling A. Shaw

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 and 39-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 and 39-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. Amendment received on 10/06/2006 has been entered into record. No claim is amended.

Claims 1-37 and 39-44 are currently pending.

2. Applicant's submission filed on 04/24/2006 was entered. Claims 1-3, 5-7, 9, 12-13, 17, 22-25, 28-30, 32-37, 39-41 and 43 were amended. Claim 38 was cancelled.

3. Amendment received on 11/23/2005 was entered. Claim 12 was amended.

***Priority***

4. This application has no priority claim made. The filing date is 10/19/2001.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 5-6, 12-14, 16-18, 22-23, 28-31, 37 and 40 are rejected under 35 U.S.C. 102(e)

as being anticipated by Aramaki et al. (US 6618760 B1), hereinafter referred as Aramaki.

- a. Regarding claim 1, Aramaki disclosed a method comprising: storing, within a network router, a forwarding tree (column 1, lines 27-31: router, forwarding destination; column 2, lines 1-6: various retrieving method, binary tree retrieving method) having a set of nodes, wherein nodes include leaf nodes that correspond to

destinations within a computer network (column 2, lines 1-14: method of retrieving the next forwarding destination, binary tree retrieval method, registered IP addresses are formed in tree structure, nodes forming the tree correspond to bit values of the bit string); storing, external to the forwarding tree, next hop data representing network devices neighboring the network router (column 5, lines 48-67: retrieving a hop pointer from a retrieval table; first tables are hierarchically arranged according to division of the destination address; second table includes a hop pointer and first-table pointer; a hop pointer is read from a finally accessed entry of the second table as a retrieval result); storing, within the leaf nodes of the forwarding tree, indirect next hop data that maps the leaf nodes of the forwarding tree to the next hop data, wherein at least two different ones of the leaf nodes of the forwarding tree contain indirect next hop data that references the next hop data for the same neighboring network device (column 1, lines 50-57: IP address of the retrieval key is "001...", "00\*" is the longer in prefix length ..., "00\*" is selected as the IP address of the next forwarding destination; column 5, line 41-column 6, line 3: hop pointers indicating next forwarding destination stored in second table); identifying a key within a network packet (column 1, lines 27-31: IP address as a retrieval key); traversing a subset of the nodes of the forwarding tree within a network device by testing at least one bit of the key per each of the traversed nodes, wherein values of the tested bits in the key determine a path traversed along the forwarding tree until reaching one of the leaf nodes of the forwarding tree (column 1, line 50-column 3, line 43: binary tree and radix tree retrieval methods); upon reaching a leaf node of the traversed path, using

the indirect next hop data within the leaf node of the traversed path to select a next hop from the next hop data external to the forwarding tree (column 6, line 17-column 7, line 10: retrieve hop pointer), and forwarding the packet to the selected next hop (column 1, lines 14-20: forward an incoming data signal such as an IP packet to a communication network).

- b. Regarding claim 2, Aramaki disclosed the method of claim 1, wherein the forwarding tree comprises a radix tree (column 2, line 14-40).
- c. Regarding claim 5, Aramaki disclosed the method of claim 2, wherein storing the indirect next hop data comprises storing a data pointer within each of the leaf nodes that references the next hop data external to the forwarding tree (column 5, line 48-column 6, line 16: hop pointer).
- d. Regarding claim 6, Aramaki disclosed the method of claim 1, wherein storing the next hop data comprises storing an array of next hop data elements external to the forwarding tree (column 5, line 41-column 6, line 3: hop pointers indicating next forwarding destination stored in second table, thus the next hop data is stored outside the first and second tables).
- e. Claims 12-14 and 16 are of the same scope as claims 1-2 and 5-6. These are rejected for the same reason as for claims 1-2 and 5-6.
- f. Claims 17-18 and 22-23 are of the same scope as claims 1-2 and 5. These are rejected for the same reason as for claims 1-2 and 5.
- g. Claims 28-31 are of the same scope as claims 1-2 and 5-6. These are rejected for the same reason as for claims 1-2 and 5-6.

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- h. Claims 37 and 40 are of the same scope as claims 1-2. These are rejected for the same reason as for claims 1-2.

Aramaki disclosed all limitations of claims 1-2, 5-6, 12-14, 16-18, 22-23, 28-31, 37 and 40.

Claims 1-2, 5-6, 12-14, 16-18, 22-23, 28-31, 37 and 40 are rejected under 35 U.S.C. 102(e).

***Claim Rejections - 35 USC § 103***

- 6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4, 7-11, 15, 19-21, 24-27, 32-36, 39 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aramaki et al. (US 6618760 B1), hereinafter referred as Aramaki, and further in view of Cain (US 6857026 B1), hereinafter referred as Cain.

- a. Regarding claim 3, Aramaki disclosed the invention substantially as claimed.  
Aramaki does not explicitly disclose storing a primary next hop reference and a backup next hop reference.
- b. Cain shows (column 4, line 12-56) specifying a preferred route and alternate route in an analogous art for the purpose of using alternate routes for fail-over in a communication network.
- c. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify Aramaki's functions of using radix tree and hop

- pointer in setting up a routing table for retrieving routes with Cain's functions of using alternate routes for fail-over in a communication network.
- d. The modification would have been obvious because one of ordinary skill in the art would have been motivated to have multiple routes per Cains' teaching in setting up routing table per Aramaki's teaching to enhance the availability with either multiple network interfaces or different next hop devices (column 4, lines 42-55).
- e. Regarding claim 4, Cain shows further comprising routing packets to the backup next hop in response to a network event (column 3, line 38-49: node failure; column 4, line 30-41: failure of link).
- f. Regarding claim 7, Cain shows further comprising: receiving a packet comprising network update information (column 5, line 51-63: control message for the route maintenance logic to determine the status of various routes); and modifying the next hop data external to the forwarding tree in response to the network update information without modifying the forwarding tree (column 5, line 19-28 and 42-50: determine and update the availability and priority of routes).
- g. Regarding claim 8, Cain shows further comprising: storing routing information within a routing engine, wherein the routing information represents routes within a network (column 5, line 9-29: routes for routing protocol messages; column 5, and 42-50: route computation and maintenance logic); and storing the route data, the indirect next hop data and the next hop data within a packet forwarding engine (column 5, line 9-29 and 42-67: route availability and priority).

- h. Regarding claim 9, Cain shows further comprising: receiving a packet comprising network topology update information (column 1, line 29-37: link state routing protocol; Fig. 2, item 204: multiple route information; column 4, line 66-column 5, line 8: multiple route, priority, preferred and alternate route information; column 5, line 29-41: route computation logic computes routes for destinations by running multiple routing protocols and computes routes); updating the routing information within the routing engine (Fig. 2, item 210: install route; column 2, line 7-10: update the availability, priority of routes, compute new routes; column 4, line 66-column 5, line 8: obtain, prioritize and install route; column 5, 19-28 and 42-50: route computation logic computes routes for destinations by running multiple routing protocols and computes routes); and issuing a message from the routing engine to direct the packet forwarding engine to modify the next hop data in response to the network update information (column 3, line 11-20: link state routing protocol; column 5, line 51-63: routing logic receives control messages and forward to maintenance logic).
- i. Regarding claim 10, Cain shows wherein storing the routing information includes storing a copy of the route data, the indirect next hop data and the next hop data stored within the packet forwarding engine (column 5, line 9-29 and 42-67: routing table).
- j. Regarding claim 11, Cain shows wherein storing the routing information includes storing a copy of the route data, the indirect next hop data and the next hop data stored within the packet forwarding engine, and issuing the message comprises



analyzing the copy to identify the next hop for modification (Fig. 2; column 4, line 66-column 5, line 67: computation logic computes routes for destinations by running multiple routing protocols and computes routes).

- k. Claims 15 and 19 are of the same scope as claim 3. These are rejected for the same reasons as for claim 3.
- l. Regarding claim 20, Cain shows wherein some of the next hop data represents software modules for processing data packets (column 6, line 1-18).
- m. Regarding claim 21, Cain shows wherein each of the software modules is selected from one of a packet filter, a policy enforcer and a packet counter (column 4, line 12-29).
- n. Claims 24-27 are of the same scope as claims 1, 8-9 and 11. These are rejected for the same reasons as for claims 1, 8-9 and 11.
- o. Claims 32-36 are of the same scope as claims 1, 7-9 and 11. These are rejected for the same reasons as for claims 1, 7-9 and 11.
- p. Claims 39 and 41-44 are of the same scope as claims 1, 3, 5 and 7-8. These are rejected for the same reasons as for claims 1, 3, 5 and 7-8.

Together Aramaki and Cain disclosed all limitations of claims 3-4, 7-11, 15, 19-21, 24-27, 32-36, 39 and 41-44. Claims 3-4, 7-11, 15, 19-21, 24-27, 32-36, 39 and 41-44 are rejected under 35 U.S.C. 103(a).

*Response to Arguments*

7. Applicant's arguments filed on 10/06/2006 have been fully considered, but they are not persuasive.

- a. Applicant has questioned the reasoning behind the using of Aramaki as the primary art in rejecting the amended claim language dated 04/24/2006. Examiner has explained in the Response to Arguments of the previous office action dated 04/24/2006. Examiner is obliged to review, search and present the latest finding upon the latest claimed invention, i.e. the amended claim language dated 04/24/2006. That is consistent with 37 C.F.R. 1.104(c) 2 as Aramaki is determined to be a better art in reflecting examiner's reading on the amended claim language dated 04/24/2006. Examiner could not see that applicant would amend the claim language as per 04/24/2006's amendment in the previous office actions dated 02/23/2006 and 08/24/2005.
- b. Applicant has further comments the usage of references from Aramaki as totally contrived, relying upon disparate unrelated passages to essentially reconstruct the claim language recited in claim 1. Examiner has gone back the rejection of claim 1, reviewed and updated the used references from Aramaki as above. Examiner has found all references used for the rejection of claim 1 are from the sections of Background of the Invention and Summary of the Invention, they are closed related the problem statements and solution of Aramaki's claimed invention, i.e. Forwarding Information Retrieval Technique. Examiner believes that the updated reference from

Aramaki in reconstructing applicant's claimed invention per claim 1 is applicable and complete in the same art as applicant claimed invention.

- c. Applicant has further comments on the references (column 2, line 5-column 3, lines 43; column 5, line 41-column 6, line 3; column 1, lines 21-26) used from Aramaki in rejecting the limitations of "storing a forwarding tree having a set of nodes, storing, external to the forwarding tree, next hop data representing network devices".

Examiner has updated the references from Aramaki in showing that there indeed exist two table, i.e. first table and second table (column 5, lines 48-67), that the first table is for storing forwarding tree (column 1, lines 27-31; column 5, lines 48-67) and the second table is for storing next hop data (column 5, lines 48-67). For detail see the above rejection section for claim 1, i.e. item a in section 5 above. Examiner reserved that the references still have the limitation of "storing a forwarding tree having a set of nodes, storing, external to the forwarding tree, next hop data representing network devices" as column 2, line 5-column 3 lines 43: showing binary tree; column 5, line 41-column 6, line 3: showing hop pointers indicating next forwarding destination stored in second table; first table have only second table pointers as entries; column 1, lines 21-26: showing output interface or an IP address of a router as the next transit destination.

- d. Applicant has further alleged Aramaki per column 6, line 17-column 7 fails to suggest indirect next hop data within a leaf node of a traversed path of a forwarding tree and the selection of a next hop form the next hop form the next hop data external to the forwarding tree. Examiner has reviewed the claim rejection with respect to the

context of other references used for the rejections of claim 1 limitations up to the limitation of “upon reaching a leaf node of the traversed path, using the indirect next hop data within the leaf node of the traversed path to select a next hop form the next hop data external to the forwarding tree” and found the referred passages (column 6, line 17-column 7) has further detailed Aramaki claimed invention (column 5, line 41-column 6, line 3) as referred in rejecting the limitation of “storing, within the leaf nodes of the forwarding tree, indirect next hop data that maps the leaf nodes of the forwarding tree to the next hop data, ...”

- e. It is the Examiner’s position that Applicant has not submitted claims drawn to limitations, which define the operation and apparatus of Applicant’s disclosed invention in manner, which distinguishes over the prior art. As it is Applicant’s right to claim as broadly as possible their invention, it is also the Examiner’s right to interpret the claim language as broadly as possible. It is the Examiner’s position that the detailed functionality that allows for Applicant’s invention to overcome the prior art used in the rejection, fails to differentiate in detail how these features are unique (see item a in section 5). Aramaki has shown using two tables to store forwarding destination lookup and next hop pointer for retrieving route resolution (column 5, lines 48-67) in the art of setting up and using routing table within a router. It is clear that Applicant must be able to submit claim language to distinguish over the prior arts used in the above rejection sections that discloses distinctive features of Applicant’s claimed invention. It is suggested that Applicant compare the original specification

and claim language with the cited prior art used in the rejection section above or the Remark section below to draw an amended claim set to further the prosecution.

- f. Failure for Applicant to narrow the definition/scope of the claims and supply arguments commensurate in scope with the claims implies the Applicant's intent to broaden claimed invention. Examiner interprets the claim language in a scope parallel to the Applicant in the response. Examiner reiterates the need for the Applicant to more clearly and distinctly define the claimed invention.

*Remarks*

8. The following pertaining arts are discovered and not used in this office action. Office reserves the right to use these arts in later actions.

- a. Medard et al. (US 6047331 A) Method and apparatus for automatic protection switching
- b. Hariguchi et al. (US 6665297 B1) Network routing table
- c. Marques et al. (US 6643706 B1) Scaleable route redistribution mechanism

*Conclusion*

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to the enclosed PTO-892 for details.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peling A. Shaw whose telephone number is (571) 272-7968. The examiner can normally be reached on M-F 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William C. Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

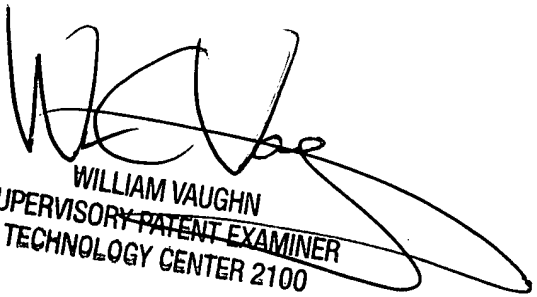
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